GEORGE WASHINGTON UNIVERSITY

CRISIS AND EMERGENCY MANAGEMENT CONCENTRATION
MASTER OF ENGINEERING MANAGEMENT DEGREE PROGRAM
ENGINEERING MANAGEMENT DEPARTMENT
SCHOOL OF APPLIED SCIENCE AND ENGINEERING

CORE COURSES (6)

EMGT 211	Organizational Behavior for the Technical Manager
EMGT 212	The Management of Technical Organizations
EMGT 254	Computer Systems and Information Management
EMGT 260	Survey of Finance and Engineering Economics
EMGT 269	Elements of Problem Solving and Decision Making for Managers
EMGT 283	Systems Engineering

ELECTIVE COURSES (1 OR MORE DEPENDING ON VALIDATION OF CORE COURSES)

CRISIS AND EMERGENCY MANAGEMENT COURSES (5 OF THE FOLLOWING 6)

EMGT 232 Crisis and Emergency Management
Description: Introduction to concepts and problems of crisis and emergency management. Defining crises, emergencies, and disasters. Developing crisis and contingency plans. National Plans-the Federal Response Plan and National Contingency Plan, organizing for response, managing the response organization, managing in a turbulent, high stress environment crisis decision making and crisis communication.

EMGT 234 Management of Risk and Vulnerability for Natural and Technological Hazards
Description: Development of concepts required for risk based planning and risk management. Objectives of and methods for vulnerability assessment for natural disaster, technological hazards, and terrorist threats. Concepts of risk analysis, risk perception, risk communication, risk mitigation.

EMGT 236 Information Technology in Crisis and Emergency Management
Description: The role of information in crisis and response management; determining disaster and crisis information requirements; information technologies applied to crisis, disaster and emergency management; the cause and effects of information breakdowns during crises and disasters.

EMGT 238 Current Issues in Emergency and Crisis Management
Description: A seminar course organized around current issues and the management successes and failures exhibited during recent disaster or crisis events. Includes presentations from federal, local, private sector and not for profit perspectives.

EMGT 332 Disaster Recovery and Business Continuity
Description: Introduction to disaster recovery planning and concepts of business continuity. Recovery of information and communication systems. The role of the private sector in mitigation and recovery. Public/private partnerships in community reconstruction and recovery.

EMGT 334 Environmental Hazard Management
Description: Analysis of the geological, meteorological, radiological, chemical and biological hazards facing U.S. and international communities. Description of organizational responsibilities for hazard identification and management. Communication and perceptions of vulnerability and risk. Challenges to local governments and communities.

THE GEORGE WASHINGTON UNIVERSITY
DEPARTMENT OF ENGINEERING MANAGEMENT
SCHOOL OF ENGINEERING AND APPLIED SCIENCE

EMGT 232: Crisis and Emergency Management

Fall 1998—Monday 6:10- 8:40 PM

Instructor:

Ms Claire B. Rubin
Adjunct Assistant Professor
GWU/ICDRM
School Of Engineering and Applied Sciences
c/o P.O. Box 2208
Arlington, VA 22202

Tel: (703) 920-7176
Fax: (703) 892-7082
E-mail: cbrubin@gwu.edu
Web Site: http://gwis2.circ.gwu.edu/~cbrubin
Office Hours: by appointment

Catalog description: "Introduction to concepts and problems of crisis and emergency management. Defining crises, emergencies and disasters. Developing crisis and contingency plans. National Plans—the Federal Response Plan and National Contingency Plan; organizing for response; managing the response organization; managing in a turbulent, high stress environment; crisis decision-making and crisis communication."

Background. Disasters have been known for millennia, with evidence from pre-historic times and accounts in the Bible. In recent years the public awareness of hazards and disasters has been growing rapidly, owing to new kinds of disasters, increased frequency and magnitude of known types of events (such as hurricanes) and to better news coverage of disastrous events.

As this course begins, the hurricane season in the U.S. is reaching its most active period. Another major natural phenomenon, El Nino, recently ended, after having attracted global attention. This El Nino episode was said to be the major occurrence of this repetitive event during this century. This El Nino received a great deal of attention and publicity, in part because of the great devastation it caused in many countries (such as Ecuador, Peru, U.S., Australia) and in part because it was a milestone of achievement for scientists who for the first time were able to predict its occurrence and areas of impact. Additionally, in recent months there have been numerous threats and emergencies connected with the built environment and with modern technology—e.g., satellite failures, threats to the Internet system (accidental and intentional), and oil spills and chemical accidents.

Although there often is extensive media coverage of disasters, rarely does the media focus on preparedness, recovery and means of reducing losses. Media coverage usually spotlights the impacts and the emergency response phase. The media do not usually mention the planning (or lack there of) that occurred, nor do they document the months or years of hardship that victims and citizens endure while they rebuild their lives and their structures that were damaged or destroyed.

This course will focus on explaining the main types of hazards, threats, and emergencies that occur in the U.S. and the organizations and individuals who deal with them. Among the topics will be:

- natural hazards, their nature and impacts
- technological hazards, their nature and impacts
- organizational arrangements and plans at the local, state, and federal levels to deal with emergencies and disasters
- nongovernmental organizations typically involved, such as the media, the American National Red Cross, professional associations and service groups
- emphasis will be given to national level or federal plans, since Washington, D.C. is the Nation's capital
- decision-making for emergencies and crises

Course Objectives:

At the end of this course, you should have

- learned basic terms and concepts of emergencies and emergency management
- become familiar with main categories of hazards/threat/emergencies
- learned about potential sources of information, both in traditional (hard copy) and newer forms (via the World Wide Web)
- gained knowledge of organizational arrangements and plans that exist—governmental, non-profit, and private—to deal with major emergencies and disasters
- acquired the ability to synthesize information and provide cogent briefings regarding hazards, threats, disasters

Required Textbooks:

(1) Cutter, Susan L. **Living with Risk: The Geography of Technical Hazards.** New York: Edward Arnold Publisher; 1993. 224 pp.

(2) Tobin, Graham A. and Montz, Burrell E. **Natural Hazards: Explanation and Integration**. New York: Guilford Press; 1997. 388 pp.

Other Required Documents and Resources:

- Internet Access
- FEMA documents (free)
- National Academy of Public Administration, **Coping With Catastrophe**, Washington, DC: NAPA, 1993.
- A large loose-leaf binder, to contain handouts

Course Requirements:

Class discussion/presentations	20%
Term paper (s)	25%
Mid Term	25%
Final Paper and presentation	30%

Class Schedule:

August 24:	Introductions; Emergency Management Terms and Concepts
August 31:	Information Resources and Use of the Internet
September 7:	Labor Day/*No class*
September 14:	Business/Corporate Perspective; Public Emergency Management
September 21:	Natural Hazards
September 28:	Natural Hazards (cont.) and Technological Hazards
October 5:	Local and State Emergency Organizations; Federal Organizations and Plans
October 12:	Columbus Day/*No class*
October 19:	Federal Organizations and Plans (cont.)
October 26:	Mid-term Exam
November 2:	Intergovernmental Relations
November 9:	International Organizations: Response and Information Sharing
November 16:	Political and Public Policy Considerations
November 23:	Political and Public Policy (continued)
November 30:	The Media
December 7:	Non-Profit Organizations (professional associations, service organizations)
December 14:	Final Papers and Presentations

THE GEORGE WASHINGTON UNIVERSITY
DEPARTMENT OF ENGINEERING MANAGEMENT
SCHOOL OF ENGINEERING AND APPLIED SCIENCE

EMGT 298.10: Information Technology in Crisis and Emergency Management

Fall 1997—Monday 6:10- 8:40 PM

Dr. John R. Harrald
Office: Staughton 208, Tel: 994-7153, Fax: 994-4606, e-mail: harrald@seas.gwu.edu
Office hours: Mon. 1:30–3:30, Tues 2:30–5:30 and by appointment

Description: The application of appropriate information technology to crisis and emergency management is a national priority. This course focuses on the unique nature of managing and decision making in the high velocity, complex, and unstructured environment created by crises and disasters. Emergency and crisis managers must take actions and make critical decisions, under great stress and time pressure, with incomplete and contradictory information. Effective management of information is critical to the success of these decisions and actions. Information management requires an understanding of the decision making process and environment, the capability, limitations, and appropriateness of available technologies, and the ability to collect, store, analyze, and communicate the information required. In short, the object is to get the right information, in the right form, to the right people, at the right time. The course describes information requirements analysis methods and information management procedures based on a conceptual framework of the nature of crises, emergencies, and disasters. Software tools such as GIS, simulation, GDSS, DSS and EIS that have been adapted to crisis and emergency management are demonstrated. Emerging hardware capabilities such as remote sensing, high performance computing and communications, and advances in interoperability that enhance crisis and emergency management are described. Potential areas for research are identified.

Objectives: A student who successfully completes this course should demonstrate the following skills and knowledge:

1. An understanding of the concepts of crisis, disaster, and emergency management.

2. A knowledge of the organizations responsible for and active in response to natural and technological disasters in the U.S. and internationally, the functions they perform, and the procedures and structures used to implement these functions.

3. An understanding of the decision environment encountered by crisis, emergency, and disaster managers.

4. The ability to determine and to structure the information requirements for a crisis or emergency management application.

5. The ability to apply technologies such as GIS, DSS and GDSS, simulations, and EIS to support crisis and disaster management.

6. An understanding of the technologies used to collect and communicate information during a crisis or emergency.

7. An understanding of problems and issues that impede the effective utilization of information technology in crisis, disaster and emergency management.

Course Products: Students are expected to complete reading assignments prior to the class indicated on the syllabus and will complete two individual case studies and a term project. The term project will consist of an in depth investigation focused on an area of potential research interest within the scope of the course. Results of the term project will be described in a classroom presentation.

GRADING: The course grade will be calculated as follows:

1. Class preparation and participation	20%
2. Individual case studies	40%
3. Term project	40%

Required Texts:

National Research Council, Computer Science and Telecommunications Board. 1996. *Computing and Communications in the Extreme: Research for Crisis Management and Other Applications* National Academy Press. Washington, D.C. 160 pp.

Notebook of readings to be distributed in class

References:

Kramer, Alcira and Mohan Munashinghe, 1991. *Managing Natural Disasters and the Environment*. The World Bank. Washington, D.C. 215 pp.

Thomas E. Drabek and Gerard J. Hoetmer, Eds. 1991. *Emergency Management: Principals and Practice for Local Government*. ICMA, Washington, D.C.

International Federation of Red Cross and Red Crescer Societies. 1996. *World Disasters Report 1996*. Oxford University Press. Oxford, U.K. (Annual publication)

Noji, Eric 1996. *Public Health Consequences of Disaster*.

Pauchant, Thierry C. and Ian I. Mitroff. *Transforming the Crisis Prone Organization*. Jossey Bass Publishers. San Francisco.

CLASS SCHEDULE:

SESSION DATE	TOPICS	READING/TUTORIAL ASSIGNMENT
1. AUG 25,1997	Introduction - Concepts of Crisis, Emergency and Disaster Management, - The disaster environment, - Information requirements for crisis and disaster management	Handout Explore the internet, determine sources of disaster related information CASE 1 ASSIGNED
2. SEP 8	Guest Speaker - Space technology applied to - Disaster Management	TBA
3. SEP 15	The decision making environment - U.S. plans (Federal Response Plan National Contingency Plan) - U.S. response organizations - International responsibilities	NRC pp. 1-34, 55-98
4. SEP 22	**Case Study 1 due (Information Requirements)** Supporting crisis decision making - Information overload - Individual and group decision making under stress - Decision and judgment support systems	TBA CASE 2 ASSIGNED
5. SEP 29	Geographical information systems - Collecting, using, updating spatial data - GIS technology	TBA
6. OCT 6	Supporting command, control, coordination and cooperation - Technology to support the multiorganization response - Coordination and cooperation vs. command and control info needs	TBA

7. OCT 14 **(Note tues class)**	Supporting the first responder - Communications - Information needs	TBA
8. OCT 20	**Case Study 2 due** **(Decision Support)** Information collection & communication - Communications breakdowns - Warning systems	TBA
9. OCT 27	Technology used for preparation planning, and mitigation - Hazard modeling and simulation for preparedness and mitigation - Vulnerability and risk analysis - Contingency planning and exercising	TBA Term Project Proposals Due
10. NOV 3	Technology to combat technological crises and disasters - Plume models, evacuation models - Oil spill modeling	TBA
11. NOV 10	The high performance computing and communications research agenda	NRC pp. 99-160
12. NOV 17	Technology in corporate disaster recovery, and organizational continuity	TBA
13. NOV 24	Technology in crisis communications	TBA
14. DEC 1	**Presentation of class projects**	

THE GEORGE WASHINGTON UNIVERSITY
DEPARTMENT OF ENGINEERING MANAGEMENT
SCHOOL OF ENGINEERING AND APPLIED SCIENCE

EMGT 238: Issues in Crisis and Emergency Management*

Spring 1999—Wednesday 6:10-8:40

Dr. John R. Harrald
Office: Staughton 208, Tel: 994-7153, Fax: 994-4606, e-mail: harrald@seas.gwu.edu
Office hours: Mon. 1:30–3:30, Tues 2:30–5:30 and by appointment
Claire B. Rubin
E-mail: cbrubin@gwu.edu

* must register for Course #298, Sec. 64 for spring 1999 semester

Course Objective:

A graduate-level seminar course, focusing on four important and topical issues in emergency management. Faculty will provide context descriptions, facilitate exploration of many dimensions of each issue area, and suggest resources for further study. Additionally, some national experts will be invited to give guest lectures, providing senior level perspectives in a timely manner for each of the main issue areas.

Course Description:

This course will consist of four main modules, which may change from year to year. It will be offered on a team teaching basis, by Prof. John R. Harrald and Adjunct Prof. Claire B. Rubin. Each module, which will last about 4 classes, will start with an outside speaker who is knowledgeable and well-known in the field to give an overview of the topic area. Subsequent classes would feature small group, interactive sessions that will explore various aspects of the topic area, with a focus on key issues.

The four major areas to be covered during the Spring 1999 course offering are:

(1) Natural Hazard Mitigation
(2) Critical Infrastructure Protection
(3) U.S. Counter-Terrorism Efforts, including Dealing With Weapons of Mass Destruction
(4) International Disasters: Impacts and Issues

The student products for each module would be either a short paper or a case study—done by an individual or group.

Course Prerequisites:

EMGT 232 or permission of the instructor

Topics/Class Sessions/Dates

Topic 1: Mitigation of Natural Hazards:

Dates: January 13, 20, 27, Feb. 3, and 10, 1999:
Lead Professor: Claire B. Rubin

(a) Overview (Prof. Krimgold, Virginia Tech)
(b) Fenwick Island Scenario
(c) Review of national mitigation efforts re two major disaster agents (floods and earthquakes)
(d) Incentives and obstacles to mitigation
(e) Current mitigation initiatives (Project Impact, insurance initiatives)

Required Reading: see below
Student Product: short paper

Topic #2: Critical Infrastructure

Class Dates: Feb. 17, 24 and March 3
Lead: Professor Harrald

(a) What is the nature of the threat and what are the federal government's concerns and plans? Key note lecture by Dr. William Harris, CIAO
(b) Five key areas of concern
(c) Infrastructure: cyber systems and financial systems
(d) Infrastructure: transportation

Required Reading:

- Presidential Decision Directives 62, 63
- Two reports on Critical infrastructure Protection, available from <www.ciao.gov>.

Student Product: Short Paper

Topic #3: U.S. Counter-Terrorism Efforts and Dealing with Weapons of Mass Destruction

Dates: March 10, [17th: no class (spring break)], 24, 31
Lead: Professor Harrald

(a) What has propelled counter-terrorism as a new federal program?
(b) Basic laws, regs, authorities

(c) Federal organizational efforts and plans for response
(d) Dealing with chemical, biological and radiological agents that have been "weaponized"
(e) How local, state, and federal governments have incorporated C-T and WMD capability into existing emergency management organizations, or created new ones.

Required Reading:

See FEMA handbook for home study program
Federal agency briefing docs, etc.

Student Product: Short paper

Topic #4: Impacts and issues related to major International Disasters and Emergencies

Class Dates: April 7, 14, 21
Lead: Claire B. Rubin

(a) What major organizations usually help other countries that have experienced a major or catastrophic disaster? (OFDA, World Bank, NVOADs)
Guest lecturer: Ms. Christina Neal, Geologist, OFDA
(b) Disasters and development issues; sustainable development...
(c) Disasters in Third World Counties; island nations.
Guest lecturer: Dr. Aldo Benini.
(a) Public health concerns after a major disaster

Required Reading: see below

Student Product: Short paper

Class on April 28: Final class—summary review and discussion.
Profs Harrald and Rubin

Course Grade:

- Class participation and presentations: 20%
- Four written products (each 20%): 80%

SOURCES OF INFORMATION
(Books, documents and websites)

Required Books:

Godschalk, David (ed.) **Natural Hazards Mitigation,** (Washington, DC: Island Press, 1998).

Recommended Reading (To be put on reserve at Gelman Library):

National Research Council. *Computing and Communications in the Extreme; Research for Crisis Management and Other Applications*. 1996. [See also information on the NRC website: [<www4.nas.edu/spsma/cstbweb.nsf>]

Twigg, John, and Mihir R. Bhatt. **Understanding Vulnerability: South Asian Perspectives.** (London: IT Publications), 1998.

Anderson, Mary B. and Peter J. Woodrow. **Rising From the Ashes: Development Strategies in Times of Disaster.** (London: IT Publications), 1998.

Other Sources of Information:

Alexander, David. **Natural Disasters** (N.Y.: Chapman and Hall), 1993.

Bradford, Janet et al. *Biological Hazards and Emergency Management* (Boulder, CO: Natural Hazard Research Center); Working Paper #82, March 1993.

General Accounting Office. *Combating Terrorism: Threat and Risk Assessments Can Help Prioritize and Target Program Investments.* GAO/NSIAD-98-74. April 1998.

Noji, Eric K. **The Public Health Consequences of Disasters.**(NY: Oxford University Press), 1997. United States Senate, *Federal Disaster Assistance.* Report of the Senate Task Force on Funding Disaster Relief, 104th Congress; Senate Doc. No. 104-4, March 15, 1995. Senator John Glenn, chairman.

Relevant Websites:

Mitigation

FEMA
<www.fema.gov/mit>

University of Colorado/Natural Hazards Center
<www.colorado.edu/hazards> - use HazLit search engine

Infrastructure:

Critical Infrastructure Office
<www.ciao.gov>-- two major reports are available via this website

Counter-Terrorism and WMD:

National Domestic Preparedness Office- provides extensive links to other sources
<www.ndpo.com>

US EPA Website; section on Counter-Terrorism
<www.epa.gov/cntr-ter.html>

International Disasters

United Nations
<www.reliefweb.int>

US Office of Foreign Disasters
<www.usaid.ofda.gov>

The World Bank
<www.worldbank.com>

Pan American Health Organization/Public Health and Hurricane Mitch
<www.paho.org/e nglish/ped/pedhome.htm>